upwards as before." This has no connection with what has gone before or what follows after. On the next page he says, "for the large and small intestine you massage the lower part" (of the abdomen), having evidently forgotten the position of the transverse colon, which anatomists still believe to be a part of the large intestine. Again, after giving all the less important uses of the saliva, he entirely omits its action in changing the starchy foods into sugar, an omission of which a second-year student would scarcely have been guilty. His readers are left in ignorance of the emulsifying action of the bile on fatty foods, and the pancreas is only considered worthy of mention. In fact the writer, after intimating that the functions of the body could be very well carried on without such an important gland as the spleen, with the modern physiology of which he does not acquaint his readers, leaves us under the impression that the organization of the human body would have been much better planned had Dr. Tibbitts been the designer.

The author claims for a battery he has invented certain qualities, which he declares to be unique, although they are possessed by other machines. He claims for his hospital the honour of being the only one to which a school for massage is attached, totally ignoring what is being done at other institutions. He is the forerunner of Apostoli, and modestly likens himself to Paul and Apollos, he does not say which. "Although Paul planted, Apollos watered," is his misquotation of the Scriptures. He robs Sir James Paget of the honour of a "discovery." Sir James "suggested," but Dr. Tibbitts "originated" afterwards! After claiming on very insufficient grounds to be a forerunner, a discoverer, and a prophet, he finally declares that all the authorities before him were as blind leaders of the blind. Charcot, Russell Reynolds, Hughlings Jackson, Gowers, and such small fry, are all wrong—for has he not looked into all the authorities?—and he now announces in defiance of them the tremendous fact that there is no such thing as hysteria! However, the apparent object of the book has been attained, and the great Holloway must hide his diminished head.

## OUR BOOK SHELF.

*Rock-forming Minerals.* By Frank Rutley, F.G.S., Lecturer on Mineralogy in the Royal School of Mines. With 120 Illustrations. (London: Thomas Murby, 1888.)

THIS book appears to supply a real want among students of that now very popular subject of study, microscopic petrography. Many of the existing text-books, which are for the most part written in German and French, demand a larger acquaintance with the principles of crystallography and physical optics than many students of the subject possess. Mr. Rutley evidently possesses a considerable experience of the wants of students, and is familiar with the kind of difficulties which prove most troublesome to them. With the greatest patience he endeavours to remove these hindrances to their progress, pointing out the different senses in which the same term is sometimes employed, cautioning them against prevalent misunderstandings, and advising them as to the best method of forming just conceptions concerning the abstruse problems with which they have to deal. Very noteworthy and excellent are the numerous drawings, which, though severely diagrammatic rather than pictorial, are admirably suited for their object. The student who follows the advice of the author, and by the aid of cardboard, cork, and pins, constructs a series of models based upon these drawings, will be able to realize the essential peculiarities of the several mineral species in a way that no amount of description will enable him to do. In the general arrangement of this book, Mr. Rutley has followed the same excellent plan as Prof. Rosenbusch in the first volume of his excellent "Mikroskopische Physiographie." The first part of the book, comprising 104 pages, is devoted to general considerations, and the second part (144 pages) to a description of the crystallographic and optical peculiarities of the chief rock-forming minerals, these being grouped according to their system of crystallization. In every part of the book there is evidence of the most painstaking care and conscientious attention to accuracy of detail, and we can heartily recommend the book to those who seek for just such an amount of information on optical principles as will enable them to employ the modern refined methods of petrographical research.

*A Text-book of Euclid's Elements for the Use of Schools.* Parts I. and II., containing Books I.–VI. By H. S. Hall, M.A., and F. H. Stevens, M.A. (London: Macmillan, 1888.)

WE have here the completion of a work which in its first instalment (Books I. and II.) has already won a considerable amount of favourable notice from teachers. The "end" has "crowned the work" in a similar satisfactory manner; and, without entering into any "odious" comparisons with recent like editions, we consider this to be abreast of the best. Great attention has been paid to the arrangement and composition of the text, and the difficulties which delay beginners have been carefully smoothed and explained. The ordinary proofs have been adhered to as much as possible, and, in the words of the preface, "changes have been adopted only where the old text has been generally found a cause of difficulty."

Alternative proofs are given in many cases, which are less cumbrous than those in vogue already. The subject of proportion has been treated on the system advocated by De Morgan, and here great use has been made of the admirable exposition of it given in the Association's (A.I.G.T.) text-book. The principal propositions have been established in a clear manner, both from the algebraical and geometrical definitions of ratio and proportion, and the distinction between the two modes of treatment is well brought out. The whole of this part forms a good introduction to the sixth book.

The additional feature in the complete treatise is the free use in the third and subsequent books of the signs and abbreviations which are recognized by most teachers, and allowed in the University examinations.

The explanatory matter and additional sections contain all, or nearly all, that is looked for nowadays, and include articles on harmonic section, centres of similarity and similitude, pole and polar, radical axes and transversals. The exercises in the text are well graduated, and should bring out the pupil's acquaintance with, and mastery over, the propositions to which they are appended. More difficult problems are led up to by the solution of typical examples. In conclusion, we need only say the work before us contains all that is needful to a student, who, if he has this, will require no other text-book to become an expert geometer—*i.e.* in so far as outside aid can make one.

*A Class-book of Elementary Chemistry.* By W. W. Fisher, M.A., F.C.S. (Oxford: Clarendon Press, 1888.)

THE number of elementary books for students of chemistry has increased so greatly during the last ten years, that each new introduction gives rise to a question as to whether the author has justified his position in adding another

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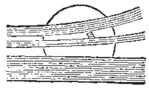
But, however far the supply exceeds the demand, there is always room for what is thoroughly good, especially if it has improvements that its predecessors lack. Though every author is apt to think his pet methods are the very best, and more or less inclined to regard his fads as steps towards perfection, if not indeed its full realization, there are a few who take a sounder view of things, and care nothing for novelty for its own sake. The author of the volume before us has shown that he is one of the few. This book is of sterling value, and will be welcomed by the teacher of elementary chemistry as a guide for his students that he will have pleasure and full confidence in placing in their hands. The volume is well got up, printed in clear type, and illustrated with a sufficient number of excellent diagrams, many from original drawings made by the author. Its 272 pages are not crowded with information or anything else, but the facts included are clearly described in a readable and concise manner. In scope, the book includes the principal non-metallic elements and their chief compounds, followed by the more important metals and their salts. The selection is good and not novel. The periodic law is briefly referred to, and the last eighteen pages are occupied with the chemical physics that it is usually considered well for elementary students to master, such as the relation between specific heat and atomic weight, critical temperature, diffusion of gases, effects of temperature and pressure upon gases, and so on.

## LETTERS TO THE EDITOR.

*[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.]*

### Alpine Haze.

PROF. TYNDALL has done good service by drawing attention to Alpine haze, and is quite right in adding that it appears in horizontal layers. Such is its common form, but I have also observed a vertical part of it connecting two horizontal striæ rendered conspicuous by concealing portions of a setting sun, just as thick boards might do. On another occasion I saw a rough column of it towards the north-west at a supposed distance of three or four kilometres. A few hours later, while I was noting down the phenomenon, a native exclaimed that it had changed its position, and on looking north-west I could see no trace of it, a column similar in size and distance being then in the north-east. It towered above my level on a rolling plain 2300 metres above the ocean. In another place I have seen it at a height of 3600 metres.



Setting sun observed February 16, 1846, at Garuqqe, in lat. 8° 0′·6, long. 36° 51′, at an altitude of 2175 metres.

Although generally overlooked by meteorologists, this phenomenon has a special name in warm countries. Portuguese call it *neblita*; in Spain it is mentioned as *callina* or *calina*, and Basques name it *lañoa*. Nowhere have I seen it so frequent and thick as in Ethiopia, every different language of that wide region having a special word to express it. The Amara call it *tigag*; the Oromo, or Galla, *qayota*; the Tigray, *taqa*; while old Ethiopic employs the term *qobar*. I have used the latter in my published accounts, because *brume* in French and *haze* in English are generic and not specific names.

*Qobar* is gray, and of a livid hue when intense, verging sometimes to blackness. The Gascon-speaking population in the Pyrenees call it *bruma terranera*, *i.e.* earth-haze. Its edges are not jagged, like those of clouds, but quite smooth. At Quarata, in 1845, when I was at the level of Lake Tana, the Island of Daga, which rises suddenly 140 metres above the water at an angular height of 16′ and a distance of 11·6 miles, was visible only by 4′ or 5′ of its upper part, the lower 11′ or 12′ being concealed by *qobar* thicker than usual, and seemingly spread on the lake. I have seen it often on the Red Sea, and sometimes even here in the Bay of Biscay towards the north.

*Qobar* is the surveyor's foe, and has made me lose several important bearings. It blurs the landscape, diminishes estimated distances, and in Ethiopia is often so thick that no feature of a country is visible beyond the space of a mile.

Fifteen years ago I published in my "Physique du Globe" all that I know about *qobar*. In Germany it goes by the name of *Heiderauch*, or by six other words all ending in "*rauch*." Ethiopians also compare it to but distinguish it from smoke. When commenting on chapter x. of Exodus, their native professors say that the darkness mentioned in verse 22 was an intense *qobar*, and go on to explain that the light enjoyed by the Children of Israel is fully borne out by the fact of *qobar* being sometimes prevalent in one place, yet absent in its neighbourhood. I have noted several instances of this partial occurrence. Without quoting them, I may mention that, according to my working hypothesis, *qobar* is only dry air, visible because in large quantity. On the other hand, astronomers well know that very moist air is the most transparent.

Natives are swarthy in countries where *qobar* abounds. Does it darken man's skin? At all events it is worth while to draw some hundred litres of it through suitable reagents. Chemists could thus test Kaemtz's notion that it is always smoke.

ANTOINE D'ABBADIE (de l'Institut).

Abbadia, Hendaye, November 10.

P.S.—I forgot to mention that, after crossing the three layers shown by the figure, the setting sun crossed two other layers, and finally disappeared behind the lower stratum of *qobar*, then 3° or 4° above the horizon.

### Rankine's Modification of Newton's Investigation of the Velocity of Sound in any Substance.

PROF. EVERETT's letter (November 8, p. 31) calls attention to a difficulty which is apparently felt by students over the attempted elementary method of deducing the general expression for the velocity of sound given in Maxwell's "Heat." Advanced students need feel no difficulty of the kind, because they arrive at it by another path; but inasmuch as the Rankine method seems the easiest available to intermediate students, it is desirable as a matter of pedagogy to put it in its simplest form; and so I venture to quote here the plan I have for some time adopted.

First lead up to the subject by considering the velocity of a hump on a stretched string. Explain the plan of imagining the string to move along at the same pace as the hump, but in an opposite direction, so as to keep the hump stationary in space, obtaining the velocity necessary to do this by equating the normal compound of the tension to the centrifugal force—

$$\mathrm{T} \cdot \frac{ds}{r} = \frac{\lambda ds \cdot u^2}{r}, \quad \text{or } u = \sqrt{\frac{\mathrm{T}}{\lambda}},$$

where T is the tension, and λ is the linear density of the string; and then actually show the experiment—running a light loose flexible endless cord on a pulley, and making a hump on it. The tension in a loose whirled endless cord free from gravity being that due to the centrifugal force only, viz.—

$$\mathrm{T} = \frac{\lambda ds \cdot v^2}{r} \cdot \frac{r}{ds} = \lambda v^2,$$

it follows that $v = u$, and so the keeping of the hump still is automatic, except for a slight interference by the weight of cord hanging below the hump. This interference being less and less notable as the hump is initially made nearer the bottom of the loop of cord.

Next explain, and illustrate by moving diagrams, the simple harmonic motion of the particles of a medium conveying sound-vibrations.

Then proceed to consider a longitudinal pulse travelling along a substance contained in a tube of unit area, and imagine a wind of the substance blowing through the tube in the opposite direction with such a velocity, U, as just to keep the pulse stationary in space.

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